

far as possible, to the dreadful and wholesale extermination which has been, and is at present, going on amongst the masses of the population, to an extent considerably greater (as has been repeatedly shown) than would be the case were we involved in a "perpetual civil war." As regards the extent of the proposed bill of health, and other accompanying remedial measures, they should not be selfishly confined to England, but the whole of Great Britain and Ireland should have the benefits which will assuredly result from them; and above all, I would bring the metropolis within the pale of the bill, as most of all requiring supervision.

The remedial measures of which I spoke in conjunction with the "bill," are the window-tax, the brick excise, and the soap excise, which ought immediately to be abolished; indeed, the only objection to such a step is, that they are sources of revenue; but when there are so many other means of raising taxes which would not operate so injuriously as these do (for instance, by a rightly-modified property-tax), that objection only appears in the light of a quibble. And here I would remark, with respect to an excellent suggestion which recently appeared in *THE BUILDER*, viz., the formation of societies all over the country, for the purpose of rendering the evils of these taxes more generally known, that I hope the brickmakers will take the lead in such a movement, as I believe the public are not sufficiently aware of the bad effects of the brick duty.

Amongst the remedial measures for which a separate but also coeval Act would be required, I class the removal of Smithfield market and the slaughter-houses with which it is surrounded, and the establishment of other markets and abattoirs in more suitable and suburban localities. The other points on which it would be desirable to legislate might all be included in the "Bill of Health," or the Sanitary Act (in prospective), and I will first briefly mention them:—

1. Sewerage and drainage.
2. Paving.
3. Scavenging.
4. Supply of water.
5. Supply of gas.
6. Prevention of intra-mural burial.
7. Establishment of cemeteries.
8. Establishment of public baths and wash-houses.
9. Establishment of public necessities for both sexes.
10. Regulation of noxious and dangerous businesses.
11. Establishment and management of fire-escapes and fire-engines, and other means for extinction of fire.
12. The obligation to consume the smoke produced in manufactories and river steamers, or in the case of the latter, to burn coke.
13. The prevention of the use of unhealthy underground cellars as living rooms.
14. The opening up of narrow courts and alleys, and in some cases their abolition.
15. Ventilation.
16. Establishment of public gardens and playgrounds, &c.

Let us now consider some of the above subjects in the order in which they are placed; and it may be remarked, in passing, that although these observations may apply, for the sake of exemplification, more particularly to the metropolis, yet they are not on that account to be considered inapplicable to other places. I cannot help thinking that the efforts which have been made for the exclusion of the metropolis, and more particularly the "city," from the operations of the general bill, are merely a subterfuge for the real purpose of excluding the metropolis altogether from any sanitary improvement, in order that the corporation, the commissioners of sewers, paving, &c., and the various parochial vestries, may retain the power in their own hands, and that, in fact, those who are so clamorous for exclusion from the general bill do not desire a separate bill. However, to return to my sixteen heads:—First, as regards Sewerage and Drainage, perhaps the most important of the whole.

The general arrangement of the sewers, I think, should be such as have been, in part at least, adopted in the Holborn and Finsbury, and Westminster divisions of the metropolis, more especially as regards the provisions of the bill lately obtained by the commissioners of the latter district. The sewers, all agree, should be of the egg or oval shape, and of no

greater size than is absolutely necessary for all present and reasonably prospective wants. All sharp angles in the sewers (and drains too) should be carefully eschewed, and the junctions formed of gentle curves in the direction of and so as to offer the least impediment to the current. This should be always enforced in the formation of house-drains, and their connection with the sewers. The sewers should have shafts or other means for the removal or neutralizing of the noxious vapours which are generated by the sewage matter. The material of the sewers, if small, might be glazed stoneware socket-pipes, the best material for drains also, (but green bottle glass socket-jointed pipes, as suggested in *THE BUILDER*, would do as well); and the large sewers should be formed of hard bricks. Ferro-metallic bricks might be used with advantage, and would be better if glazed,—of a wedge shape, made to suit the form and size of sewer, and set in suitable cement or mortar.

There should be a compulsory clause in the bill, obliging the formation of public sewers in every public place, whether street, court, or alley, &c., and wherever a sewer exists within a reasonable distance, or wherever one may be formed, every dwelling-house should have an efficient trapped drain into the sewer, as well as all workshops and manufactories also. This clause of the bill should in every case be strictly enforced.

No sewage matter should be discharged into the river (and this applies equally well to all other towns, &c.); but it should be conducted to a considerable distance, and applied to agricultural purposes.

Immense advantages would accrue to the public if this system of conveying the sewage manure into the country were generally adopted. In the present state of things, the larger the number of sewers and drains constructed in the metropolis, and the more efficient its sewerage and drainage in other respects becomes, the more the Thames itself will approximate to a large open sewer; and I firmly believe that if we persist in discharging the contents of our sewers into the river, it will ere long become such an intolerable nuisance, that we shall be compelled to, shall I say "arch it over," as was the case with the "Fleet ditch," which was formerly a navigable "river," but has now, also, degenerated into a common sewer. What would your readers think of the "Thames ditch," or the "Thames sewer," being the designation of "Old Father Thames?" Any one who has been in the habit of travelling by the river steamers, or who has resided or been taken by his avocations in the neighbourhood of the Thames, must be fully aware of the stench which arises from the river, especially at low water, when the accumulations of filth are exposed to the air: and the water, as is well known, contains so much filth in solution, that it cannot be used for any household purposes without filtration, which would not be the case if the sewage of the metropolis were not emptied into it, and the manufactories (gas works among the rest) were not allowed to throw what they deem their refuse (?) into our great highway.

A private company propose to obviate the evil; but although I am confident that the principle is good, yet I should not like to see it carried out by the company, for the following reasons:—

Because their scheme does not embrace the whole of the metropolis, and because the profits which would be derived from the undertaking would go into the pockets of the shareholders; whereas, were the same plan applied to the whole of the metropolis, under the superintendence of a General Metropolitan Sanitary Commission, the returns would enable them to considerably reduce, or perhaps abolish altogether, the sewer-rates; and in the hands of a public body it would be carried out with more attention to the public interests than by a private company.

The remaining points under my first head, which should be included in the Act, are the compulsory establishment in every dwelling-house, workshop, manufactory, &c. of water-closets, and the abolition of privies and cess-pools.

I will now proceed to the second subject—Paving.

The benefits of good paving should be extended to all footways and carriageways within the jurisdiction of the Act. For streets

where the traffic is not very great red brick might be used, as at Brighton, or hard bricks or tiles in patterns. For carriage-way paving, either small granite, as on London and Blackfriars bridges, or wood, might be used. The latter material is capable of great improvement; the wood, previous to being used, should undergo a chemical preparation, to harden and preserve it from decay. A good foundation, both for foot and carriage-ways, is a great requisite, not only to prevent settlements, but also to prevent the surface water from penetrating into the earth, and thus finding its way into the basements of houses, cellars, &c. This may be attained by the use of good concrete, or, what is better still, small granite, such as is used for macadamizing, run in with gas-tar, another use for the refuse (?) of coal-gas, and fine gravel. The paving should also be well grouted in, after having been first rammed, and it should not be used immediately afterwards, as is now the custom.

The macadamizing system seems unfit for application in towns; indeed, it should be only used for country roads. If you observe any of the streets of London which are macadamized, in wet weather you will find that they are always muddy, whereas those streets which are well paved with granite or wood, are always much cleaner. I do not mean to say that they are as they ought to be, because the scavenging (to which I shall refer presently) is so bad, that this cannot be expected; but still they are better in this respect. As a case in point, I have never seen Fleet-street cleaner than after a heavy shower of rain, and I have never observed parts of Oxford-street, which are macadamized, in a more filthy state than under the same circumstances. In dry weather, also, the macadamized roads are more dusty than paved roads; indeed, well paved roads, if kept properly swept, would be entirely free from both dust and mud, and such a state of things will, I hope, be attained ere long. Good paving is quite as essential as good drainage, indeed, it is itself a system of surface drainage, and sewers and drains are of very little use without it.

I have stated that a good foundation is a great desideratum in order to prevent settlements in the paving, which break the curve of the roadway and form puddles in wet weather, besides causing a continual expense in relaying the paving; but however good a foundation is made when the paving is first put down, it cannot be long retained while the roadways are continually being broken up to get at the gas and water-pipes.

The chief cause of the partial failure of the wood paving is simply this:—The grooves get choked up with mud, so that a smooth surface is formed, which renders it dangerous for the horses in wet weather, but this may be easily remedied by all the grooves being formed at exactly regular distances, and by the use of rakes with teeth to fit the grooves, and which the scavengers should use before sweeping the wood paving. This brings me to my third subject—Scavenging.

It must be admitted that there has been some improvement of late in the metropolis, and in the "city" in particular, in this respect, but the system is still very ineffective as regards the principal streets which, in the "city," are swept by men who are stationed the whole of the day along the principal lines of thoroughfare, and are provided with a broom and shovel, and an iron vessel somewhat like a pail, in which they deposit the sweepings, until the cart comes round to receive its contents; but this arrangement is a decided failure, and the best proof of this is, that the streets where it is adopted are never thoroughly clean except in dry weather, while the smaller streets, which are swept once a day, in the ordinary manner, are always in a much better state, although there is room for improvement in them. I consider that the principal streets, where the traffic is great, should be swept by a gang of men, accompanied by a cart or carts, twice a day, in the morning and in the afternoon; and the smaller streets, lanes, courts, alleys, squares, &c., once a day, in the same manner; and the foot-ways as well as the carriage-ways should come under the operations of the scavengers. In dry weather the streets, before being swept, should be watered, otherwise clouds of dust are raised to the great detriment of the shopkeeper, and the great in-